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## THE LANGUAGE OF CHILDHOOD.

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The profound psychogenetic significance of the language function, not only as an *index* of mind development, but also as a *factor* in that development, justifies its treatment in a separate chapter. Such separate treatment would not otherwise be justifiable, inasmuch as language does not constitute a new psychic phenomenon, or class of phenomena, differing in any essential respect from those already treated. It rather partakes of the nature of them all, and constitutes a grand product of their conjoint operation.

In order to the employment of language of any sort,<sup>1</sup> there must be, in the first place, *sensation*. If sounds are to be intelligently uttered, they must first be heard. The child who is born deaf, and continues in that condition, does not learn to speak. In the second place, language presupposes *perception* and *judgment*. The sounds must not only be heard, they must be understood. A meaning must be attached to them. Otherwise they will never be given back by the child as the expression of his thought; *i. e.*, as his *language*. In the third place, it is essential to any advance beyond the merest linguistic rudiments, that abstraction and generalization take place; for the communication of thought, in its highest forms, cannot take place until there has been attained the comprehension of the general as distinguished from the particular, and of the abstract as distinguished from the concrete.<sup>2</sup> Finally, passing from the cognitive to the volitional aspect of mind, it is obvious that language, in its most essential characteristic—*i. e.*, as expression—belongs to the will. Every expression of thought, whether it be word or mark or gesture, is the result of an act of will, and as such may be classed among movements.

It is not, therefore, as constituting a new order of facts, different from thoughts and feelings and volitions, but rather as illustrating the development of these, and entering as a factor in that development, that language receives this separate place. We judge of the child's mental development largely by the rapidity of his progress towards a skillful manipulation of the instruments of expression.

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<sup>1</sup> Although our chief attention is occupied here with the spoken word, this is by no means the only form of language. In its broadest sense, language includes every means by which thought is communicated; and therefore the gestures of the deaf-mute, and the hieroglyphic characters on Egyptian monuments, as well as the written manuscript and the printed page, are as really language as the most eloquent oral paragraphs, because they are the expression of someone's thought. As Broca says, language is "the faculty of establishing a constant relation between an idea and a sign," whatever that sign may be. All that can be said, therefore, concerning the psychological importance of the spoken word, applies equally, *mutatis mutandis*, to every other means of communication.

<sup>2</sup> On the other hand, thought itself cannot attain to any great degree of generality without the aid of language. Thought and language are mutually helpful, and conduce each to the development of the other.

## I.—HEREDITY VS. EDUCATION IN LANGUAGE.

There is no psychological problem to the solution of which a study of the infant mind may be expected to contribute more largely than this: What is hereditary, and what is acquired, in the sphere of language? Long before maturity is attained, such an abundance of acquired material has been added to our original store, and through constant repetition, the two have become so transformed, modified and assimilated in character, that we are no longer able to distinguish the one from the other. But from the beginning it was not so. If a child executes a gesture, or utters a sound, at an age so early as to exclude the possibility of imitation or spontaneous invention on his part, we may conclude that the sound or the gesture—or, at least the disposition to express himself in this manner—has been born with him. Here only, then, are we able to apply the logical method of difference to the solution of the problem.

It is obvious, at a glance, that speech is a product of the conjoint operation of these two factors: *heredity* and *education*. If, on the one hand, we observe the initial babbling of the infant, and notice its marvelous flexibility, and the enormous variety of its intonations and inflections—and this at an age so early as to preclude observation and imitation of others,—it will be apparent that the child has come into the world already possessing a considerable portion of the equipment by which he shall in after years give expression to his feelings and thoughts. If, on the other hand, we carefully observe him during the first two years of his life, and note how the intonations, and afterwards the words, of those by whom he is surrounded, are given back by him—at first unconsciously, but afterwards with intention—and how, when conscious imitation has once set in, it plays thenceforth the preponderating rôle,—we shall readily believe that, without this second factor, but little progress would be made towards speech-acquirement.

It may be well to consider briefly how these two factors enter at every point in the development of language. For example, in order to speak, the child must possess first of all a sensory and motor physiological apparatus. This physiological apparatus, including the auditory structure for the reception of sounds, the inter-central and centro-motor cells and nerve tracts for the accomplishment of connection between the impression and the expression, and the organs of vocal utterance (larynx, palate, tongue, lips, teeth), is his inheritance from the past, but in the new-born child it is all imperfect, both in structure and in functioning; and its development requires the constant moulding influence of those educating agencies by which the human being is surrounded from the moment of his entrance into the world.

Again, the *disposition* to utter sounds of all sorts, and to express states of feeling by them, is undoubtedly inherited, since, from the very beginning of life, and quite independently of all example, the child constantly exercises his vocal organs.<sup>1</sup> But in spite of this, so inadequate is heredity alone, that the child will not learn the language of his parents, unless he be in the society of those who employ it. If brought up among savages, he will speak their language; if among wolves, he will howl.<sup>2</sup>

<sup>1</sup>"Le langage est en nous une faculté si naturelle, que dès la première enfance, l'exercer est un besoin et un plaisir."—*Egger*.

<sup>2</sup>"It is found that young birds never have the song peculiar to their species, if they have not heard it; whereas, they acquire very easily the song of almost any other bird with which they are associated."—*Alfred Russell Wallace, Natural Selection*.

In making this statement, we do not overlook those remarkable cases in which children have invented a language of their own, quite different from that spoken around them; and persisted for some time in using the former and entirely ignoring the latter. Mr. Horatio Hale gives an account of five different cases in which this has occurred, two in the United States and three in Canada. In one case this invented vocabulary consisted of twenty-one root-forms, out of which, by combination and modification, the children developed a complete language, by which, with the aid of gesture, all their wants could be communicated; and in all the cases the invented language was sufficient for all intercourse as between the children themselves; and was persistently used until the children were finally broken of it, by being separated or sent to school<sup>(56)</sup>. In all these cases, it is to be observed, the child did not learn the language of his parents in the absence of those who employed it. It is also to be noted that the new language was invented, not by one child, but by *two*. Language is *possible* in all normal children; it becomes *actual* only in the presence of a companion. But given the companion, and scarcely any limit can be set to the possibilities of development. Indeed, Mr. Hale has given us a theory of language, in which the origin of linguistic stocks is attributed to the inventiveness of children who have become separated from their tribe when very young; and in the light of such facts as those given above, the theory seems highly probable. On the other hand, that the child shall speak any specific tongue now existing, depends on his education. He does not inherit any particular tongue or dialect. Some think he will acquire his mother-tongue with greater facility than any other<sup>(57)</sup>, yet even this may be doubted. "Speech is hereditary, but not any particular form of speech"<sup>(3)</sup>. There may be an inherited tendency to find certain sounds difficult, such as *sh* to the ancient Ephraimite, or *th* to the modern Frenchman, but this is only a tendency, and does not prevent the child from learning any language perfectly, if his education begins early enough.

Again, the careful study of the language of signs makes it quite clear that many gestures are inherited (e. g., holding out the hands to express desire, which is world-wide, and is executed by children who have never seen it done), but the development of gesture into anything like a complicated system of expression, is quite dependent on the social environment. Of course this is only another way of saying that language, being the instrument for the communication of thought, is not developed in the absence of beings to whom thought can be communicated.

Thus, then, the case seems to stand with regard to the respective spheres of heredity and education in the production of language. As regards the child's present endowment and capabilities at the moment of his entrance into the world, "he is the product, the result of the generations which have preceded him; he is the visible link which connects the past with the future"<sup>(58)</sup>; but with regard to that which he is to be, and the legacy which he in his turn shall transmit to those who shall succeed him, he is very largely dependent on his physical and social environment; and all those who compose that environment, assist, whether they will or no, in his education.<sup>1</sup>

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<sup>1</sup>"La mère, au reste, ou la nourrice, ne sont ici que des institutrices en chef; car tous ceux qui entourent l'enfant au berceau qui convergent en sa présence, participent, sans s'en douter, à cette éducation fondamentale" (99:32).

## II.—THE PHYSIOLOGICAL DEVELOPMENT.

If the question were asked, "Why does not the new-born child talk?" two answers might be given. In the first place, there is a psychological reason, viz., he has, as yet, no ideas, and has, therefore, nothing to say (<sup>27</sup>). In the second place, there is a physiological reason, viz., his speech-apparatus is as yet so imperfectly developed that he could not express ideas if he had them.

In the same way, if the question were asked, Why does any person ever lose the power of speech? similar answers might be given. He either loses his ideas, through some mental disorder, or he loses the power of expression through some physiological disorder. The two cases are, moreover, parallel in another sense, inasmuch as the acquirement of ideas in the one case, and their failure in the other, are closely associated with, if not indeed quite dependent upon, the presence or absence of the physiological functions.

The physiological reason, then, why the child does not yet speak, lies in the undeveloped state of the speech-apparatus. "The lungs are not yet developed in a degree and manner sufficient for articulate speech. The expiration needs to be strong, and exactly regulated. Now, in the infant, the pectoral muscles are still developed in a very small degree; the breathing is accomplished much more through the fall of the diaphragm than through the active extension of the pectoral cavity. Hence, breathing movements are more superficial and more irregular than in later years. Artificial speech requires complete control of the breathing mechanism, which the child has not yet got. To his speech-instrument is still wanting a large number of strings, whistles and registers. The organs of speech are the lungs, air tubes, larynx and vocal cords, the mouth, with tongue, palate, lips and teeth. The lungs create the stream of air; the tone and voice are formed by the larynx; according as the vocal cords open wider or come nearer, arises the deeper or higher tone. The *form* of the tone (*i. e.*, vowel *a* or *o*, etc., consonant *b* or *f*, etc.) depends on the form of the mouth at the time. Now the larynx is still very small and undeveloped in its form, and so with the tongue, the lips, and the muscles moving them; and as for the teeth, they are still entirely wanting" (<sup>27</sup>). The undeveloped condition of the auditory apparatus, and of the brain, have also to be considered in this connection.

On the other hand, it needs to be borne in mind that the relation between the organs of speech and speech itself is a reciprocal one. If speech depends on the organs, it is also true that the organs depend on speech, and are not developed, except by exercise. As one learns to play on the harp by playing on the harp, so the child learns to speak by speaking. The exercise of the vocal organs develops those organs, so that they become capable of higher exercise.

The *lungs* first appear, early in the embryonic stage, as a single median diverticulum from the ventral wall of the œsophagus, which soon becomes dilated towards the two sides in the form of primitive protrusions or tubercules, while the root, communicating with the œsophagus, remains single. The fetal lungs contain no air, and lie, packed in a comparatively small compass, at the back of the thorax. They undergo very rapid and remarkable changes after birth, in consequence of the commencement of respiration. They expand so as to completely cover the pleural portions of the pericardium, their margins become more obtuse, and their whole form less compressed. The entrance of the air changes their

texture so that it becomes more loose, light and spongy, and less granular; while the great quantity of blood, which, from this time on, circulates through them, greatly increases their weight, and changes their color. The proportion of their weight to that of the body becomes nearly twice as great as before, while, at the same time, their specific gravity, after the beginning of respiration, becomes very much less (<sup>8: 887</sup>).

The *trachea*, or windpipe, which connects the lungs with the larynx, is in the embryo almost closed, its anterior and posterior walls being very near each other. The small space remaining is filled with mucus. With the exercise of respiration, the mucus is expelled, and the tube itself gradually becomes more distended, but its anterior wall does not for some time become convex. With the growth of the child, the cartilages which form the "ribs" of the trachea, become stronger and better able to bear their part in the forcible expiration of air which is required for speech (<sup>8: 508</sup>).

The *larynx*, which is the organ most directly concerned in the production of "voice" or "tone," is an exceedingly complicated mechanism, consisting of a framework of cartilages comprising no less than nine distinct parts, connected by elastic membranes or ligaments, two of which, from their specially prominent position, are named the true vocal cords. In speaking and singing, these cartilages are moved relatively to one another by the laryngeal muscles. The larynx is situated at the upper end of the trachea, the mucus lining of the two organs being continuous. At the time of birth, this organ is very small and narrow, and continues comparatively insignificant up to the period of adolescence, when rapid and remarkable changes take place, especially in the case of the male, where it becomes much more prominent, and the *pomum adamæ* protrudes so to be perceptible at the throat (<sup>8: 522</sup>).

The *tongue* is composed very largely of muscular fibres, running in various directions, such as the superior and inferior lingual muscles, which move the organ up and down, and the transverse fibres, by which it is moved from side to side. Besides these, we have the various glossal muscles, which, though extrinsic to the tongue itself, yet are implicated in its operations. These muscles are all more or less flabby in the fœtus and the new-born, and become strong only by nutrition and exercise. A similar remark applies to the lips; while the teeth, without which the dental and labio-dental consonants can never be properly pronounced, are at the beginning of life entirely absent, though the first steps toward their formation take place as early as the seventh week of the period of gestation (<sup>8: 555</sup>).

The *brain* of the fœtus is comparatively deficient in convolutions, and presents a smooth, even appearance. The first of the primary fissures to appear is the fissure of Sylvius, which is visible during the third month. The other primitive sulci also begin to appear about this time, and by the end of the fifth month are well established. The secondary sulci make their appearance from the fifth or sixth month on. The first of these to be seen is the fissure of Rolando. "By the end of the seventh month, nearly all the chief features of the cerebral convolutions and sulci have appeared. The last fissures to appear are the inferior occipito-temporal, and a small furrow crossing the end of the calloso-marginal" (<sup>8: 886</sup>). But long after the extra-uterine life begins, the child-brain is still deficient in many of the higher processes, the association fibres being the last to develop. The convolutions are for a long time comparatively simple, and their increasing complexity as life

advances stands to the exercise of the various faculties, partly in the relation of antecedent, and partly in that of consequent.

Speech, then, in the little child is a potentiality, though not an actuality. He is, as it were, in possession of the machine, but the belts have not yet been adjusted to the pulleys, nor has he yet learned to handle the instrument. The inability to speak is not, therefore, an *abnormal* state at the beginning of life, any more than the inability to write or swim or play the piano (<sup>3: 38</sup>). It is merely an *imperfect* state. But the inability to *learn* to speak is abnormal, and its cause must be sought, not in immaturity, but in abnormality, of the physiological or psychological structures and processes involved. The one is an unnatural condition, into which the child has fallen; the other a natural condition, out of which he will gradually rise.

### III.—PHONETIC AND PSYCHIC DEVELOPMENT.

We shall here, first of all, give a sort of outline history of the speech-progress of the average child during the first two years, generalizing from a large number of actual observations (made by different persons on different children) and proceeding by periods of six months each; then we shall give summarized statements of a number of child-vocabularies that have been carefully compiled at different ages; and finally, we shall examine what general conclusions may be drawn from the material at hand, and set down as empirical laws, awaiting further substantiation. I say "empirical laws," because children differ so much from each other, and reliable observations are so comparatively scanty that, for the present, general statements must be held in abeyance, or made only tentatively.

*First Six Months.*—"In Thuringia," says Sigismund, "they call the first three months 'das dumme Vierteljahr,'" and during the second three months, according to Schultze, no advance is made on the first. It might seem, then, that in this first half-year there is nothing worthy of our attention in the matter of language. This, however, is very far from being the case, for in this period a most important apprenticeship is going on. The little child, even in the cradle, and before he is able to raise himself to a sitting posture, is receiving impression every waking moment from the environment; is hearing the words, seeing the gestures, and noting—in a manner perhaps not purely involuntary—the intonations of those around him; and out of this material, he afterwards builds up his own vocabulary. Not only so, but during this period, that peculiarly charming infantile babble (which Ploss calls "das Lallen") begins, which, though only an "awkward twittering" (<sup>6</sup>), yet contains in rudimentary form nearly all the sounds which afterwards, by combination, yield the potent instrument of speech. A wonderful variety of sounds, some of which afterwards give the child difficulty when he tries to produce them, are now produced automatically, by a purely impulsive exercise of the vocal muscles; in the same way as the child at this age performs automatically many eye-movements, which afterwards become difficult, or even impossible (<sup>42</sup>). M. Taine thinks that "all shades of emotion, wonder, joy, willfulness and sadness" are at this time expressed by differences of tone, equaling or even surpassing the adult (<sup>37</sup>).

The child's first act is to cry.<sup>1</sup> This cry has been variously inter-

<sup>1</sup>"Sobald das Kind zur Welt geboren ist, fängt es an gellend zu schreien" (1). "The child is born into the world! He enters it struggling; a scream is his first utterance" (<sup>37</sup>).

puted. Semmig calls it "the triumphant song of everlasting life," and describes it as "heavenly music" (himmlische Musik); Kant said it was a cry of wrath, and others have spoken of it as a sorrowful wail on entering this world of sin; or as a foreboding of the pains and sorrows of life. It seems more scientific, though less poetic, to accept the explanation of the "unembarrassed naturalist," who sees in it nothing more nor less than the expression of the painfulness of the first breathing—the rush of cold air upon the lungs (<sup>1</sup>).

A more important point is the relation of this first vocal utterance to the speech that is to follow. The cry at first is merely an automatic or reflex "squall," without expressive modulation or distinctive timbre; the same cry serves to express all sorts of feelings. But very soon it becomes differentiated and assumes various shadings to express various mental states. This differentiation begins at different times in different children. A girl only fifteen days old expressed her desire to be fed by a particular sort of cry (<sup>6</sup>). In another case, the cry had ceased to be a mere squall by the end of the first month (<sup>1</sup>). In another, the feelings of hunger, cold, pain, joy and desire were expressed by different sounds before the end of the fifth week (<sup>38</sup>). Others report the transition from the "cry" to the "voice" (<sup>36</sup>), involving coöperation of the mouth and tongue, at different times, but all within the first three months (<sup>11</sup>).

These cries are variously described. According to one, "the cry of pain is generally longer continued than the cry of fear" (<sup>60</sup>). Another speaks of the cry of fear as "short and explosive," while hunger is expressed by a long drawn out wail (M). Another child at two months expressed pleasure and pain by different forms of the vowel *a*. Sigismund's boy, in his sixth month, expressed pleasure by a peculiar crowing shout, accompanied by kicking and prancing.

The next step is taken when these cries and babblings assume an articulate character. The alphabetic sounds begin to be heard. Of these, the vowels usually precede the consonants; and of the vowels, *a* with its various shadings is generally the first to appear.<sup>1</sup> In one case the following series was developed: *ā-a-u* (<sup>27</sup>). In another, the sound of *a-a*, as an expression of joy, was heard in the tenth week (<sup>8</sup>). According to Löbische, the vowels developed in this order: *a-e-o-u-i* (<sup>61</sup>). One child began with *a*, and then proceeded to *ai-ā-au-ā*, while the pure sound of *ō* was late in appearing. In another case all the vowels were heard in the first five months, *ā* being the most frequently employed; and in another, the primitive *a* (of which the child's first cries largely consisted) became differentiated into the various vowel-sounds during the

<sup>1</sup> It is necessary at this point to adopt a system of diacritical marks, as in all that follows the child's pronunciation is of great importance. We shall, therefore, adopt the following system, and shall take the liberty of changing, wherever necessary, the spelling of the recorded observations, for the sake of uniformity:

*a* as in *calm*.

*ā* as in *fat*.

*â* as in *fate*.

*ä* as in *awl*.

*ä* (German *a* umlaut).

*e* as in *pet*.

*ē* or *ee* as in *eat, feet, etc.*

*i* as in *pit*.

*î* as in *ice*.

*o* as in *pot*.

*ō* as in *old*.

*ö* (German *o* umlaut).

*oo* as in *food*.

*ōō* as in *foot*.

*u* as in *up*.

*ü* as in *use*.

*ü* (German *u* umlaut).

Some changes will also be made in the use of the consonants. For example, such words as *corner, chorus, coffee*, etc., will be spelled with a *k*; words like *cigar, center, cellar*, etc., with an *s*; and in such words as *write* the silent *w* will be omitted. Other changes will be indicated as they are made.



first month (<sup>19</sup>). Preyer reports the use of the vowel-sounds in the following order: *uā-ao-ai-uao-ā o a-ā a a-o ā ū-ū-e-ā-t-u*; and Sigismund in the following: *a-ā-u-ei-o-i-ō-ū-āu-au*.

Long before the sixth month, the primitive vowels are combined with one another (as we see) and with consonants, to produce the first syllabic utterances. These first syllables are, for the most part, mechanical. In a great many of the cases under consideration, the first consonants to make their appearance are the labials, *b-p-m*, and these are almost always initial at first, and not final. The easy consonant *m*, combined in this way with the easy vowel *a*, yields the familiar combination *ma*, which, by spontaneous reduplication, becomes *mama*. In a similar manner, *papa*, *baba* (afterwards *baby*) and the like, are constructed. The labials are not always, however, the first consonantal sounds uttered. Sometimes the gutturals (*g* or *k*) precede them; and the two consonants which are usually the last to appear (viz., *r* and *l*) are used by some children quite early. In the case of the boy A., the first sounds were guttural, *gg*, though the earliest combination was *mam-mam*, used in crying. At five months "he dropped the throat-sounds almost entirely, and began the shrill enunciation of vowels;" and at six months he lowered his voice and began to use lip-sounds, simultaneously with the cutting of his first teeth. In another case, *m* appeared as the first consonant in the second month and was followed by *b-d-n-r*, occasionally *g* and *h*, and very rarely *k*; the first syllables were *pa-ma-ta-na* (<sup>88</sup>). Löbische observed the consonants in this order: *m-(w)-b-p-d-t-l-n-s-r*; Sigismund in this: *b-m-n-d-s-g-w-f-ch-k-l-r-sch*; and Dr. Brown in this: *b-p-f-r-m-g-k-h-t-d-l-n* (<sup>19</sup>). In some cases nearly all syllables have been correctly pronounced during the first half-year (<sup>3</sup>); while in others progress is much slower, very few syllables being certainly mastered before the ninth month (<sup>62</sup>).

We may sometimes observe here also the beginnings of vocal imitation. The boy A. was observed to "watch attentively the lip-movements of his attendants;" and other observers have remarked, from about the fourth month, "a curious mimicry of conversation, imitating especially the *cadences*, so that persons in the adjoining room would think conversation was going on" (<sup>3</sup>). The same thing was observed in A. a little later.

*Second Six Months.*—Most children make a very marked advance during this period in the imitation of sounds, in the intentional use of sounds with a meaning, and in the comprehension of the meanings of words and gestures. The actual vocabulary of most children at this age is, however, exceedingly small. Many children, a year old, cannot speak a single word, while the average vocabulary does not probably exceed half a dozen words.

A new advance accompanies the rise of active hearing, and the increasing power of attention in the third three months. The child begins to keep a sort of time to music, in which he shows pleasure, and this strong excitement stimulates the production of new sounds (<sup>27</sup>). He delights in being carried about with a galloping rhythmic motion, and will smack his lips and make other sounds in imitation of chirping to a horse (M). He pats his hands together in imitation of the accompanying motions in a nursery rhyme, and sometimes makes an attempt to say the words also. He shows a fondness for ringing the changes on certain syllables which he has learned, varying and reduplicating: e. g., *mama*, *baba*, *gaga*, *nana*, etc., and other less intelligible combinations.

He understands many words which he cannot pronounce, and he

pronounces some in a mechanical way without understanding. He knows each member of the household by name, and will reach a biscuit to the person named to him. He knows the principal parts of his own body, and will point to them when asked (M) <sup>(3)</sup>. The words *papa* and *mama*, whose surprising universality may be partly accounted for by the physiological law of ease (the sound most easily produced and, therefore, earliest used, being naturally associated with those persons whose presence arouses the earliest and most vivid emotions and ideas), are by many children at this time intelligently used, though some are later in this.

Imitation usually makes rapid strides in this period. In one case gestures were imitated at eight months, and words at nine. If someone is being called, the child also calls loudly. In another case, towards the end of the child's first year, he began to imitate the sounds made by animals and inanimate objects <sup>(8)</sup>. Sigismund observed the instinct of imitation showing itself in the third quarter of the first year; the reduplication of syllables composed of a labial or dental consonant and the vowel *ā*; and the more frequent occurrence of syllables in which the vowel is initial. Champney's child distinctly imitated the *intonation* of the voice when any word or sentence was repeated to him several times. This has been observed also in other cases (m).

Children who are able to use a few words at this age, show by their use of them how inadequately defined is their meaning. A little girl, who had learned to say *ā gā* (all gone) and *gā gā* (gegangen), applied the latter term to herself when falling down (M). Humphreys says the child he observed was able, at this time, to name many things correctly, and to pronounce all initial consonants distinctly, except *th-t-d-v* and *l*. Some final consonants were indistinct. Another child, at eleven months, knew what *guten tag* meant, and responded with *tata*; he also answered *adieu* with *adaa*. In this case, the first association of a sound with a concept was *ee*, which meant *wet* <sup>(3)</sup>. A boy of ten months used intelligently the words *mama*, *Aggie* (Maggie, this afterwards became *Waggie*) and *addie* (auntie). At eleven months, *Waggie* was shortened to *Wag*, and *addie* to *att* (A). Another at seven months used to wave his hand and say *tata* at parting; and one day he did this when a closet door was opened and shut again <sup>(3)</sup>. Taine's little girl at twelve months, on learning the word *bébé*, as connected with the picture of the infant Jesus, afterwards extended it, curiously enough, not to all babies, but to all pictures. Occasionally a word is invented, such as the word *mum*, reported by Mr. Darwin, which the child used with an interrogatory sound when asking for food, but also "as a substantive of wide signification." I observed a similar general use of *da*, in the case of F. In another case, the word *bo* was used to signify anything that pleased the child. The words *mama*, *papa* and *babe*, which had been used for some time mechanically, were dropped about the middle of this period, to be resumed five months later, "when they were applied to their proper objects" <sup>(19)</sup>. Sully observed in the beginning of this period (which he calls the *la la* period) the rise of spontaneous articulation. Combinations of syllables were suddenly hit upon, and repeated without any meaning, except as indications of baby feeling. Long *ā* indicated surprise, and "a kind of o, formed by sucking in the breath, indicated pleasure at some new object" <sup>(24)</sup>. In one case, a little sentence—which really consisted of two words—was uttered by a child at the close of this period. He said: "*Papa—mama*," which meant: "Papa, take me to mama" <sup>(6: 251)</sup>.

The wide differences among children make it unsafe to venture any generalizations, except one, viz., this second half-year seems to be *par excellence* the period of the rise of imitation. Some children, however, are as far advanced at the beginning of this period as others are at its end. Perhaps it ought also to be remarked that the child who shows a great precocity in imitation, or in learning to speak, will not necessarily, on that account, turn out a more intelligent child. Imitation does not require a very high degree of mental acuteness, and the child who has been slow in this *may* in the end surpass his more precocious companion.

*Third Six Months.*—While the child is learning to walk, there is very often a standstill, or even a retrograde movement in the matter of speech. After walking is mastered, the acquisition of language goes forward again with greater facility than ever.

During this third period, marked progress is usually made in the understanding of words, and in their intelligent application, though the vocabulary is still very limited, and the pronunciation imperfect. Difficult sounds are omitted, or replaced by easier ones. Sometimes the change in one consonant has an influence on another which precedes or follows it. In longer words and combinations, only the prominent part—the accented syllable, or the final sound—is reproduced. A final *ie* is often added to words. The child says *dinnie* for *dinner*, *ninnie* for *drink*, and *beddy* for *bread*. Other imperfect pronunciations are: *apy tee* (*apple tree*), *piecy book* (*picture book*), *garny* or *nannie* (*grandma*), *pee* (*please*), *pepe* (*pencil*), *mo-a* (*more*), *hō* or *hā* (*horse*), *Deibert* (*Gilbert*), *Tot* (*Topf*), *Ka-ka* (*Carrie*), and *Kakie* (*Katy*).

Most children at this age understand a great deal of what is said to them. Such phrases as “bring the ball;” “come on papa’s knee;” “go down;” “come here;” “give me a kiss,” are perfectly understood and obeyed. Parts of the child’s body, as eyes, nose, ear, other ear, hand, etc., other person’s eyes, ears, etc., are pointed to when named. Articles are fetched, carried and put where one commands (A), (F), (W).

Some children begin, towards the end of this period, to express themselves in short sentences, which are usually elliptical, or, as Romanes says, “sentence-words,” only the most prominent word or words in the sentence being pronounced. *E. g.*, *ta* (*thank you*), *nee* (*take me on your knee*) (<sup>25</sup>); *det off*; *det up*; *where cows George?* (*where are Uncle George’s cows?*) (M); *mo-a*, *mama* (*give me more*, *mama*); *dao* (*take me down from my chair*) (<sup>26</sup>). Many combinations of words are made, which fall short of the dignity of sentences. *E. g.*, *mama dess*, *ding-a-ling*, etc. A boy of eighteen months “knows the last words of many of Mother Goose melodies, as *moon O*; *place O*; *bare, bare, bare*; putting them in at the right time, enthusiastically” (<sup>65</sup>).

Some words are invented by the child. *E. g.*, the word *tem*, which Taine’s little girl spontaneously used as a sort of general demonstrative, “a sympathetic articulation, that she herself has found in harmony with all fixed and distinct intention, and which consequently is associated with her principal fixed and distinct intentions, which at present are desires to take, to have, to make others take, to look, to make others look” (<sup>37</sup>). The same child invented the word *ham* to signify “something to eat,” just as Darwin’s boy used *mum* for the same purpose.

The love of reduplication shows itself very distinctly now, as indeed it has almost from the beginning; no doubt for the physiological reason that it is easier for the vocal organs to execute a

movement over again, to which they are adjusted, and which they have performed once, than to adjust themselves to a new movement. Very probably the love of repetition and "jingle" which is so noticeable in children (and which, as Sigismund says, lies at the foundation of rhyme), also enters as a factor here. Numerous examples of the onomatopoeic naming of animals and things may also be observed at this time, though many of these are, no doubt, imitated from grown-up people. One or both of these tendencies may be observed in such expressions as the following: *dada*, *mama*, *papa*, *wawa* (*water*), *wah wah* or *oua oua* or *bow wow* (*dog*), *es es* (*yes*), *nī nī* (*nice*), *ko ko* (*chicken*), *puff* (*wind*), *quack quack* (*duck*), *golloh* or *lululu* (*all rolling objects*), *bopoo* (*bottle*), *too too* (*cars*), *tuppa tuppa tee* (*potato*), etc. The child imitates (often spontaneously) the sounds made by the dog, cat, sheep, ticking of clock, etc., while many sounds are reduplicated. The opposite process, a spontaneous curtailing of certain words, may be sometimes noticed. In one case a boy of fifteen months contracted *papa*, *mama* and *addie* into *pa*, *ma* and *att* respectively, having never heard any of these latter words (A).

Imitation is now very strong. The child attempts to repeat everything he hears; but some sounds give him difficulty, and the shifts to which he resorts in such cases are of very great interest. The boy R. used to say *nana* for *thank you*, and *dit tait* for *get caught* (in play); but the phrase *excuse me* was too much for him; he therefore used *ōhō* in its place, with a rising inflection on the second syllable. Singing is often imitated better than speech. A boy of fourteen months "gave back a little song, in the right key" (1:120); and another, in the sixteenth month, knew some simple little hymns (16).

But perhaps the most interesting thing of all at this time is the gradual "clearing" of the childish concepts, as indicated by the steady circumscription of the application of names. Even yet, however, names are applied much too widely; much more experience is necessary before they acquire, in the young mind, a clear and definite connotation. (Even in mature life, most of our concepts are still very hazy and ill-defined; and it might be allowable to describe the whole process of intellectual education as a process of the clarification of the concept.) It is interesting, also, to note how the principle of association enters as a factor in the determination of the application of the name. When a child calls the moon a lamp, or applies his word *bō* (*ball*) to oranges, bubbles, and other round objects; calls everything *bow wow* which bears any sort of resemblance to a dog (<sup>64</sup>) (including the bronze dogs on the staircase, and the goat in the yard) (<sup>67</sup>); applies his words *papa* and *mama* to all men and all women respectively; makes his word *citte* do duty, not only for *knife*, but also for *scissors*, *shears*, *sickle*, etc. (<sup>68</sup>); says *bā* (*bath*) on seeing a crust dipped in tea (<sup>64</sup>); applies *ati* (*assis*) to *chair*, *footstool*, *bench*, *sitting down*, *sit down*, etc. (<sup>66</sup>); *peudu* (*perdu*) or *atta* (*gone or lost*) to all sorts of disappearances;—it is evident that one great striking resemblance has overshadowed all differences in the objects. Another child, who had learned the word *ōt* as a name for objects that were too warm, extended it to include, also, objects that were too cold (association by contrast). Later, on looking at a picture, he pointed to the representation of clouds and said *ōt*. The clouds reminded him, no doubt, of the steam from the tea-kettle (<sup>64</sup>). This aptitude for seizing analogies, which Taine believes to be the source of general ideas and of language, has numerous illustrations, not only in the

language of the child just learning to speak, but also in the use of words by uncivilized or semi-civilized peoples.<sup>1</sup>

*Fourth Six Months.*—During the latter half of the second year linguistic progress is usually so rapid as to render a detailed account impossible. We can only call attention, with examples, to some of the most striking features.

"By the end of the second year," says Schultze, "the normal child can make himself understood in a short sentence." His own child was able, at nineteen months, to use sentences containing subject, predicate and object. In another case, quite a complicated sentence (but very elliptical, only the nouns being uttered), was heard in the twentieth month (<sup>1:147</sup>). In the case of A., a genuine sorrow was the occasion of his first sentence. His father, of whom he was very fond, had been playing with him for some time, and finally, being called away, put him down and went out, closing the door behind him. The child gazed for a moment at the closed door, and then, throwing himself on the floor, cried out, *I want my papa*. Before this, he used to express himself chiefly in elliptical sentences and sentence-words. When slightly over two years of age, he used to weave little stories of his own; e. g., *mama fâ wite downy toppy hoof*. One day, while the dinner was waiting for his father, who was expected home on the train, the child said: *Toot-toot comy wite up tair, iny doh, uppy tãpool; toot-toot make big noise*. Another of his sentences was: *Take a badie bidy to; badie tiehd, feepy*. The boy C. uttered his first sentence in the twenty-first month: *Pees mama*. Two months earlier he had used sentence-words; e. g., *papa cacker* (*papa has fire-crackers*). In the twenty-fourth month he told quite an extensive story, in which the verbs were not expressed. Even compound sentences, and sentences containing subordinate clauses, are often mastered before the close of this period (<sup>54</sup>) (<sup>67</sup>). Sometimes verbal inflections appear; e. g., *naughty baby klide* (*cried*) (<sup>28</sup>). Another day the same child said *comed* for *came*, thus unconsciously rebuking the inconsistent English language. Interrogative sentences appeared in another case; e. g., *where's pussy?* and negation was expressed by an affirmative sentence, with an emphatic *no* tacked on at the end, exactly as the deaf-mutes do. Many of these primitive sentences are in the imperative mood, and many are still "sentence-words." Most children talk a great deal, and gesticulate profusely, at this time. Their expressions are concrete, and abstract words are avoided as far as possible. A little boy, on seeing the picture of a half-grown lad, spoke of it as a *little baby man* (A). Anything that has rhyme or rhythm is most easily picked up. A little nephew of my own was able, at this age, to sing a large number of little songs and hymns, giving the melody quite correctly. Another boy, at twenty-one months, on hearing the milkman's bell in the morning, used to say: *Mik man mik cow, crump horn, toss dog, kiss maid all florn*; or peeping through the fence at the cows, would sing: *Moo cow, moo cow, how-de-do cow* (<sup>65</sup>).

The child's progress is marked here by his gradual mastery of the personal and possessive pronouns. These are peculiarly difficult for the average child, and, according to Egger, are not usually attained until near the close of the second year; according to others, much later still (thirtieth month, according to Lindner). Previous to mastering the *I*, the child calls himself by his proper name, or by the name *baby*, as he may have been taught. When *I*

<sup>1</sup>See Romanes' *Mental Evolution in Man*, chap. 8.

first appears, it is frequently employed,—quite consistently from the child's point of view,—not in the first person, but in the second; i. e., he calls others *I* and himself *you*. One child used the word *I* correctly as early as the nineteenth month, but often exchanged it for her proper name (<sup>27</sup>). Another, in the twentieth month, still called himself by his proper name, but, a month later, said *me* for the first time (<sup>64</sup>). Another spoke of *me* as a personality in her twenty-second month (<sup>16</sup>). Another, at two years, often used the word *my*, meaning *your*; e. g., *let me get up on my lap* (<sup>68</sup>). Another, at the same age, still speaks of himself as *baby* in ordinary converse, but in great desire says, *I want it*, and in great fear says, *I afraid*.

In some cases, almost all the sounds are mastered by the end of the second year, but from the observations at hand, this may be considered the exception. Most children still have difficulty with certain sounds. Some of these difficulties are seen in the following: *apoo* (*apple*), *zhatis* (*there it is*), *es* (*yes*), *yleg* (*egg*; note difficulty with initial vowel), *oken* (*open*), *tash* (*mustache*), *sh'ad* (*thread*), *dam* (*gum*), *t'al* (*shawl*), *uppervator* (*elevator*), *nobella* (*umbrella*), *bannicars* (*banisters*), *aw yi* (*all right*), *setto* (*cellar*), *pato* (*potato*), *it da* (*sit there*). One observer reports a special difficulty with *s*, *z*, *d*, *g*, *k*, *l*, *n*, *g*, *r* and *t* (<sup>20</sup>). Another says that at nineteen months, the sounds *s*, *sh*, *ch* and *j* were generally indistinct; while *w*, *v* and *f* were formed, but not well developed. On the other hand nasal *g* appeared, *o* was mastered, *l*, *p* and *t* as final consonants began to be used, and *k* became a favorite sound, used in many words. Sibilants were more at command when final than when initial, while short *a* was just beginning to be formed. In the twenty-second month the sounds of *ch*, *j* and *th* were still imperfect, the hard sound of *th* being replaced by *s* and the soft sound by *z*. A month later, *r* was still generally replaced by *l*; when *s* came before another consonant, one or the other was dropped, and *k* was sometimes confused with *p* or *t* (<sup>26</sup>). In another case, the double consonant *sp* made its first appearance at the end of the second year (1).

There are still many examples of the inadequate limitation of the concept. In one case the word *poor*, which was learned as an expression of pity, was applied on occasion of any sort of loss or damage whatsoever, and was even used in speaking of a crooked pin. *Dam* (*gum*), with which toys were mended, became a universal remedy for all things broken or disabled; and afterwards, when the child acquired the word *sh'ad* (*thread*), broken things were divided into two classes, viz., those that were to be mended with *dam*, and those that were to be mended with *sh'ad* (26). *Behwys*, in another case, was at first the name for all small fruits, but afterwards became restricted, yielding a portion of its territory to *gape* (*grape*) (A). Another little boy extended his word *gee-gee* (*horse*) to a drawing of an ostrich, and a bronze figure of a stork; and his word *apoo* (*apple*) to a patch of reddish-brown color on the mantel-piece (<sup>64</sup>), (<sup>69:43</sup>). The boy C. applied the word *bōke* (*broke*) to a torn pocket-handkerchief; and R. extended his word *dō* (*door*) to everything that stopped up an opening or prevented an exit, including the cork of a bottle, and the little table that fastened him in his high chair.

Healthy children of two years of age will usually attempt all sorts of sounds in imitation of others, and will practice on new and difficult combinations with great perseverance, sometimes carrying the word through several stages of transition, until it finally assumes

the perfect form. The boy A. first heard the word *pussy* when seventeen months old; he at once undertook to say it, but called it at first *pookeh*, then *poofle*, then *poopohie*, then *poofee*, until finally, after much persevering practice, he was able to say *pussy*, when he seemed to be satisfied, and discontinued its use, except when pussy was in sight. Schultze gives, among others, the following examples: The German word *wasser* passed through these stages,—*wawaff*—*fafaff*—*waffwaff*—*wasse*—*wasser*; the word *gros mama* was first *ômama*, and then *dôsmama*, before assuming its final form. The strength of the reduplicating tendency, and the influence of the initial consonant on the remainder of the word, is seen in the following imitations: *wawa* (*Mary*), *dudu* (*Julia*), *ih ih* (*little*), *ba ba* (*blanket*), *fafa* (*faster*), *mama* (*master*), *papa* (*pasture*), *nana* (*naughty*) (<sup>42</sup>).<sup>1</sup>

I have taken the trouble to collect, for purposes of comparison, a number of vocabularies of children, which have been recorded by careful and competent observers, with as much completeness and accuracy as possible. I will now give these in summarized form, so as to show the relative frequency of the various sounds as initial, and also the relative frequency of the various parts of speech. In order the more accurately to show the sounds actually made by the child, I have been obliged to use an alphabet differing somewhat from the ordinary English alphabet. The following changes are made: *c* is dropped out altogether, such words as *corner*, *candy*, etc., being classed under *k*; words like *centre*, *cigar*, etc., under *s*; and words like *chain*, *cheese*, *chair*, etc., forming a new series under *ch*. Words like *George*, *gentleman*, etc., are classed under *J* instead of *G*; words like *Philip* under *F*; words like *knife*, *knee*, etc., under *n*; and words like *wrap*, *write*, etc., under *r*. Other new letters besides *ch* are *sh* and *th*. In short, it is sought to classify the child's words according to his pronunciation, and not according to the English alphabet. If he says *tatie* for *potato*, the word is classed under *t*. I am convinced that this is the only way to obtain reliable and valuable results.

I. A child of nine months is reported as speaking "nine words plainly." The words are not given (<sup>16</sup>).

II. A boy at twelve months has "four words of his own" (<sup>16</sup>).

III. A child of twelve months uses ten words with meaning. Six of these are nouns, two adjectives and two verbs (<sup>6</sup>). The initial sounds are *m* (three times), *p* (four times), *n*, *a* and *k* (each once).

<sup>1</sup> I cannot forbear quoting the following from Sigismund in this connection. A child of twenty-one months attempted to repeat, line by line, a piece of poetry after another person. The first line in each pair represents the pronunciation of the adult, the second the imitation of the child:

Guter Mond, du gehst so stille,  
Tute Bohnd, du tehz so tinne.  
Durch die abendwolken hin,  
Duch die aten-honten in.  
Gehst so traurig, und ich fühle,  
Tehz so tautech, und ich büne.  
Dass ich ohne Ruhe bin,  
Dass ich one Ule bin.  
Guter Mond, du darfst es wissen,  
Tute Bohnd, du atz es bitten.  
Weil du so verschwiegen bist,  
Bein do so bieten bitz.  
Warum meine Thränen fliesen,  
Amum meine tänen bieten.  
Und mein Herz so tratirig ist,  
Und mein Aetz so atich iz (1:144).

IV. A child of one year used eight words, seven of which were nouns, and one an adverb. The initial sounds are *b* (four times), *m*, *p*, *d* and *u* (once each) (T).

V. The boy R. had at command about twenty words, thirteen of which were nouns, and four or five interjectional words. For initial sound *b* was preferred, then *p* and *t*.

VI. Another child is reported, at fifteen months, as having "syllables, but no words" <sup>(16)</sup>.

VII. A girl of seventeen months is reported as using thirty-five words, twenty-two of which are nouns, four verbs, two adjectives, four adverbs and three interjections. The initial sounds are *d* (eight times), *s* (four), *m*, *b* and *ch* (three each), *p*, *t*, *k*, *a* and *y* (two each), *i*, *j*, *n*, *o* (one each) (L).

VIII. A girl of twenty-two months uses twenty-eight words, distributed as follows: Nouns sixteen, verbs three, adjectives three, adverbs and interjections five. The initial sounds are *b* (six times), *d* (five), *m* (four), *p* (three), *g*, *h* and *k* (two each), *e*, *i*, *n* and *o* (one each) (G).

IX. A girl at two years employs thirty-six words, distributed as follows: Nouns sixteen, adjectives four, pronouns three, verbs seven, adverbs three, interjections three (G). Initial sounds are *p* (five times), *m*, *b* and *w* (each four times), *g*, *k* and *h* (each three times), *d*, *i*, *n* and *r* (each twice), *a* and *o* (each once).



X. Summary of the vocabulary of a little boy in Washington, D. C., aged nineteen months (K).

XI. Vocabulary of a girl of twenty-one months; the daughter of an Andover professor (K).

XII. Vocabulary of a girl of twenty-two months in Worcester, Mass. (F).

XIII. Vocabulary of a girl in Brooklyn, N. Y., in her twenty-third month (S).

|        | Nouns. | Adj. | Pron. | Verb. | Adv. | Prep. | Conj. | Interj. | Total. |        | Nouns. | Adj. | Pron. | Verb. | Adv. | Prep. | Conj. | Interj. | Total. |
|--------|--------|------|-------|-------|------|-------|-------|---------|--------|--------|--------|------|-------|-------|------|-------|-------|---------|--------|
| A      | 2      | 1    | 1     | 1     |      |       | 1     |         | 5      | A      | 6      |      |       |       |      |       |       | 3       | 9      |
| B      | 10     | 2    |       | 2     |      |       |       |         | 25     | B      | 3      |      |       |       |      |       |       |         | 6      |
| Ch     | 4      | 2    |       | 1     |      |       |       |         | 8      | Ch     | 3      |      |       |       |      |       |       |         | 9      |
| D      | 4      | 2    |       | 1     |      |       |       |         | 10     | D      | 3      |      |       |       |      |       |       |         | 6      |
| E      | 1      | 1    |       | 1     |      |       |       |         | 3      | E      | 1      |      |       |       |      |       |       |         | 2      |
| F      | 1      | 1    |       | 1     |      |       |       |         | 3      | F      | 1      |      |       |       |      |       |       |         | 2      |
| G      | 3      | 3    |       | 2     |      |       |       |         | 8      | G      | 1      |      |       |       |      |       |       |         | 3      |
| H      | 3      | 4    |       | 2     |      |       |       |         | 10     | H      | 1      |      |       |       |      |       |       |         | 3      |
| I      | 1      | 1    |       | 1     |      |       |       |         | 3      | I      | 1      |      |       |       |      |       |       |         | 2      |
| J      | 8      | 8    |       | 3     |      |       |       |         | 20     | J      | 1      |      |       |       |      |       |       |         | 2      |
| K      | 5      | 1    |       | 2     |      |       |       |         | 8      | K      | 1      |      |       |       |      |       |       |         | 2      |
| L      | 2      | 2    |       | 1     |      |       |       |         | 5      | L      | 3      |      |       |       |      |       |       |         | 8      |
| M      | 2      | 2    |       | 1     |      |       |       |         | 5      | M      | 3      |      |       |       |      |       |       |         | 8      |
| N      | 2      | 1    |       | 1     |      |       |       |         | 4      | N      | 3      |      |       |       |      |       |       |         | 4      |
| O      | 2      | 1    |       | 1     |      |       |       |         | 4      | O      | 3      |      |       |       |      |       |       |         | 4      |
| P      | 6      | 1    |       | 5     |      |       |       |         | 12     | P      | 3      |      |       |       |      |       |       |         | 6      |
| Q      | 2      | 1    |       | 1     |      |       |       |         | 4      | Q      | 3      |      |       |       |      |       |       |         | 4      |
| R      | 13     | 1    |       | 9     |      |       |       |         | 25     | R      | 1      |      |       |       |      |       |       |         | 16     |
| S      | 7      | 1    |       | 1     |      |       |       |         | 9      | S      | 2      |      |       |       |      |       |       |         | 11     |
| Sh     | 2      | 1    |       | 1     |      |       |       |         | 4      | Sh     | 2      |      |       |       |      |       |       |         | 3      |
| T      | 7      | 1    |       | 1     |      |       |       |         | 9      | T      | 9      |      |       |       |      |       |       |         | 11     |
| Th     | 2      | 1    |       | 1     |      |       |       |         | 4      | Th     | 1      |      |       |       |      |       |       |         | 3      |
| U      | 4      | 1    |       | 1     |      |       |       |         | 6      | U      | 3      |      |       |       |      |       |       |         | 1      |
| V      | 1      | 1    |       | 1     |      |       |       |         | 3      | V      | 2      |      |       |       |      |       |       |         | 3      |
| W      | 1      | 3    |       | 1     |      |       |       |         | 5      | W      | 3      |      |       |       |      |       |       |         | 3      |
| Z      |        |      |       |       |      |       |       |         | 7      | Z      | 2      |      |       |       |      |       |       |         | 3      |
| Total. | 78     | 19   | 36    | 4     | 1    |       |       |         | 144    | Total. | 37     | 4    | 1     | 9     | 8    |       |       |         | 69     |

XV. Vocabulary of a Vermont boy, twenty-four months old (C).

XVI. Vocabulary of a Boston boy, slightly over two years old. This vocabulary is probably not quite complete (A). [It is of course very difficult to obtain an absolutely complete child vocabulary.]

XVII. Vocabulary of a girl, in her twenty-fifth month (K).

|         |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
|---------|---|----|----|----|---|----|----|----|---|---|----|---|----|---|---|----|---|---|----|----|----|----|---|---|----|----|--------|
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  | 11 | 2 | 13 | 15 | 18 | 5 | 1 | 32 | 2 | 13 | 7 | 7 | 19 | 1 | 9 | 24 | 4  | 17 | 6  | 4 |   | 12 | 3  | 263    |
|         | A | B  | Ch | D  | E | F  | G  | H  | I | J | K  | L | M  | N | O | P  | Q | R | S  | Sh | T  | Th | U | V | W  | Z  | Total. |
| Nouns.  | 4 | 20 | 1  | 5  | 7 | 1  | 10 | 1  | 8 | 2 | 4  | 9 | 1  | 4 | 1 | 15 | 1 | 1 | 5  | 17 | 13 | 2  | 1 | 1 | 5  | 1  | 169    |
| Adj.    | 2 | 1  |    |    |   |    | 1  | 1  | 4 |   |    | 3 |    |   |   |    |   |   | 2  | 3  | 1  |    |   |   |    | 22 |        |
| Pron.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    | 7  |        |
| Verb.   | 1 | 4  |    | 2  | 1 |    | 6  | 6  | 1 |   |    | 5 |    |   |   |    | 3 | 4 | 5  | 1  | 1  |    |   | 5 |    | 75 |        |
| Adv.    | 1 |    | 1  |    |   |    |    |    |   |   |    |   |    |   | 1 |    |   |   |    |    |    | 2  |   |   |    | 7  |        |
| Prep.   |   |    |    |    |   |    |    |    | 1 |   |    |   |    |   | 1 |    |   |   |    |    |    |    |   |   |    | 4  |        |
| Conj.   |   |    |    |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |
| Interj. |   | 1  |    |    |   | 1  |    |    |   |   |    |   |    | 1 |   | 1  |   |   |    |    | 1  |    |   |   |    | 3  |        |
| Total.  | 8 | 26 | 5  |    |   |    |    |    |   |   |    |   |    |   |   |    |   |   |    |    |    |    |   |   |    |    |        |

**XVIII.** Vocabulary of a San Francisco girl, in her twenty-seventh month (K).

XIX. Vocabulary of a Chicago boy, in his twenty-eighth month (D).

XX. Vocabulary of a girl of twenty-eight months (K).

XXI Vocabulary of a Boston boy of thirty months. Probably not complete (T).

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|         |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
|---------|----|----|----|---|---|---|----|---|---|---|---|----|----|----|----|----|----|---|----|----|---|----|---|---|---|---|--------|
|         | A  | B  | Ch | D | E | F | G  | H | I | J | K | L  | M  | N  | O  | P  | Q  | R | S  | Sh | T | Th | U | V | W | Z | Total. |
| Nouns.  | 4  | 13 | 7  | 4 | 6 | 1 | 8  | 2 | 1 | 2 | 1 | 11 | 9  | 9  | 7  | 3  | 12 | 4 | 1  | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.    | 2  |    |    | 3 | 1 |   | 2  | 1 | 2 |   |   | 4  | 1  | 1  | 1  |    |    | 1 | 1  |    |   |    |   |   |   |   |        |
| Pron.   |    |    |    |   |   | 2 |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Verb.   |    |    |    | 1 | 1 | 1 | 2  |   |   |   |   | 4  |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Adv.    | 3  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Prep.   |    |    |    |   |   |   |    |   | 1 |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Conj.   | 1  |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Interj. |    |    |    |   |   |   |    |   |   |   |   |    |    |    |    |    |    |   |    |    |   |    |   |   |   |   |        |
| Total.  | 10 | 15 | 8  | 9 | 9 | 7 | 12 | 5 |   |   |   | 15 | 15 | 11 | 10 | 16 | 1  | 6 | 19 | 1  | 1 | 1  | 1 | 1 | 1 |   |        |

|        |   |    |    |   |   |   |   |   |   |   |   |    |   |   |   |   |    |   |   |    |   |    |   |   |   |   |        |
|--------|---|----|----|---|---|---|---|---|---|---|---|----|---|---|---|---|----|---|---|----|---|----|---|---|---|---|--------|
|        | A | B  | Ch | D | E | F | G | H | I | J | K | L  | M | N | O | P | Q  | R | S | Sh | T | Th | U | V | W | Z | Total. |
| Nouns. | 4 | 13 | 7  | 4 | 6 | 1 | 8 | 2 | 1 | 2 | 1 | 11 | 9 | 9 | 7 | 3 | 12 | 4 | 1 | 14 | 1 | 6  | 1 | 6 | 1 | 1 |        |
| Adj.   | 2 |    |    | 3 | 1 |   | 2 | 1 | 2 |   |   | 4  | 1 | 1 | 1 |   |    | 1 | 1 |    |   |    |   |   |   |   |        |
| Pron.  |   |    |    |   |   | 2 |   |   |   |   |   |    |   |   |   |   |    |   |   |    |   |    |   |   |   |   |        |
| Verb.  |   |    |    | 1 | 1 | 1 | 2 |   |   |   |   | 4  |   |   |   |   |    |   |   |    |   |    |   |   |   |   |        |

Summarizing these vocabularies, we find some interesting facts bearing on language-growth, both on the physiological and on the psychological side.

For example, with regard to the relative frequency of the various parts of speech, the following table is instructive. Of the five thousand four hundred words comprising these vocabularies.<sup>1</sup>

|       |           |                  |
|-------|-----------|------------------|
| 60    | per cent. | are nouns.       |
| 20    | " "       | " verbs.         |
| 9     | " "       | " adjectives.    |
| 5     | " "       | " adverbs.       |
| 2     | " "       | " pronouns.      |
| 2     | " "       | " prepositions.  |
| 1.7   | " "       | " interjections. |
| 0.3   | " "       | " conjunctions.  |
| <hr/> |           |                  |
| 100.0 |           |                  |

Of the nouns, less than one per cent. are abstract. Nearly all are names of persons or familiar objects. The majority, in the earlier months, seem to be used almost with the force of proper nouns, as Schultheiss has also observed (<sup>75</sup>). The adjectives are mostly those of size, temperature, cleanliness and its opposite, and similar familiar notions. This table also corroborates Sigismund's observation that the conjunction is especially difficult (<sup>1: 135</sup>). Another interesting point is the comparison of the above table with a similar table, showing the relative frequency of the various parts of speech in ordinary adult language. Professor Kirkpatrick says that of the words in the English language,

|     |           |               |
|-----|-----------|---------------|
| 60  | per cent. | are nouns.    |
| 11  | " "       | " verbs.      |
| 22  | " "       | " adjectives. |
| 5.5 | " "       | " adverbs.    |

An important consideration is involved here. If we look only at the first of these two tables, and consider the child's words by themselves, it will *seem* that the nouns have greatly the advantage over the other parts of speech. But such a conclusion obviously cannot be drawn, unless a comparison of the child's vocabulary with that of the adult justifies us in so doing. In order to show that the child learns nouns more easily than verbs, we must be able to show that the number of his nouns bears a larger proportion to the number of nouns he will use as an adult, than the number of his verbs bears to the number of verbs he will use in adult life. To represent the matter symbolically,

|     |   |   |  |
|-----|---|---|--|
| Let | n | = | the proportion of nouns in the child's vocabulary. |
| And | N | = | " " " " " " man's "                                |
| Let | v | = | " " " verbs " " child's "                          |
| And | V | = | " " " " " " man's "                                |

Then, if the child learns nouns more easily than verbs, the proportion of *n* to *N* will be greater than that of *v* to *V*. But on comparing the two tables, the very opposite is found to be the case.

<sup>1</sup>In all the calculations that follow, I have taken the liberty to *include*, along with my own vocabularies, those of Professor Holden (<sup>68</sup>), and Professor Humphreys (<sup>67</sup>), which I have re-arranged phonetically for the purpose.

$$\text{For } \frac{n}{N} = \frac{60}{60} = 1$$

$$\text{But } \frac{v}{V} = \frac{20}{11} = 1.81+$$

In other words, the child of two years has made nearly twice as much progress in learning to use *verbs* as in learning to use *nouns*; according to my tables of child-language and Professor Kirkpatrick's table of adult-language. A comparison of the adjectives and adverbs in the two tables justifies a similar conclusion in favor of the adverb. To my mind, this fact—which, so far as I know, has been hitherto overlooked by all writers on child-language—possesses great value for philology and pedagogy as well as for psychology. In the first place it supports the view that the acquisition of language in the individual and in the race proceeds by similar stages and along similar lines. Max Müller says that the primitive Sanscrit roots of the Indo-Germanic languages all represent *actions* and not *objects*; that in the race the earliest ideas to assume such strength and vividness as to break out beyond the limits of gesture and clothe themselves in words are ideas of movement, activity. We have found, from examination of the vocabularies of these twenty-five children, that the ideas which are of greatest importance in the infant mind, and so clothe themselves most frequently (relatively), in words, are the ideas of *actions* and not *objects*, of *doing* instead of *being*. The child learns to use *action-words* (verbs) more readily than *object-words* (nouns); and words descriptive of actions (adverbs) more readily than words descriptive of objects (adjectives).

In the second place this fact confirms the Froebelian principle, on which child-education is coming more and more to be based, viz., that education proceeds most naturally (and, therefore, most easily and rapidly) along the line of motor activity. The child should not be so much the receptacle of instruction as the agent of investigation. Let him *do things*, and by doing he will most readily learn. He should not be *passive*, but *active* in his own education. The kindergarten is the modern incarnation of this idea, but the idea itself is as old as Aristotle, who says, "We learn an art by *doing* that which we wish to do when we have learned it; we become builders by building, and harpers by harping. And so by doing just acts we become just, and by doing acts of temperance and courage we become temperate and courageous."<sup>1</sup>

Turning now to the consideration of these vocabularies from the standpoint of *ease or difficulty of pronunciation* of the various simple sounds, we find some instructive data here also. The following table shows the relative frequency of the various sounds as *initial*. In this calculation no heed is paid to the English spelling of the words, but only to the sounds actually uttered by the child, as already pointed out. Of the five thousand four hundred words

|      |     |       |       |      |     |       |    |    |
|------|-----|-------|-------|------|-----|-------|----|----|
| 11.  | per | cent. | begin | with | the | sound | of | b. |
| 10.3 | "   | "     | "     | "    | "   | "     | "  | s. |
| 9.   | "   | "     | "     | "    | "   | "     | "  | k. |
| 8.   | "   | "     | "     | "    | "   | "     | "  | p. |
| 6.1  | "   | "     | "     | "    | "   | "     | "  | h. |
| 6.   | "   | "     | "     | "    | "   | "     | "  | d. |
| 6.   | "   | "     | "     | "    | "   | "     | "  | m. |

<sup>1</sup>Eth. Nic., Bk. II. chap. 1, par. 4.

|     |     |       |       |      |     |       |    |     |
|-----|-----|-------|-------|------|-----|-------|----|-----|
| 6.  | per | cent. | begin | with | the | sound | of | t.  |
| 5.2 | "   | "     | "     | "    | "   | "     | "  | w.  |
| 4.  | "   | "     | "     | "    | "   | "     | "  | f.  |
| 4.  | "   | "     | "     | "    | "   | "     | "  | n.  |
| 3.2 | "   | "     | "     | "    | "   | "     | "  | g.  |
| 3.1 | "   | "     | "     | "    | "   | "     | "  | l.  |
| 3.  | "   | "     | "     | "    | "   | "     | "  | a.  |
| 3.  | "   | "     | "     | "    | "   | "     | "  | r.  |
| 2.  | "   | "     | "     | "    | "   | "     | "  | i.  |
| 2.  | "   | "     | "     | "    | "   | "     | "  | sh. |
| 1.3 | "   | "     | "     | "    | "   | "     | "  | th. |
| 1.2 | "   | "     | "     | "    | "   | "     | "  | e.  |
| 1.1 | "   | "     | "     | "    | "   | "     | "  | o.  |
| 1.  | "   | "     | "     | "    | "   | "     | "  | ch. |
| 1.  | "   | "     | "     | "    | "   | "     | "  | j.  |
| 1.  | "   | "     | "     | "    | "   | "     | "  | y.  |
| 0.8 | "   | "     | "     | "    | "   | "     | "  | u.  |
| 0.5 | "   | "     | "     | "    | "   | "     | "  | v.  |
| 0.2 | "   | "     | "     | "    | "   | "     | "  | q.  |

A glance at this table shows how prominent a place the explosive consonants occupy as initial sounds in child-language. The vowels, on the contrary, though undoubtedly the earliest sounds to be used in most cases, are very infrequent as *initial*, not only absolutely but relatively. In the English dictionaries the vowel *a* occupies fourth place as initial letter (<sup>66</sup>), (<sup>68</sup>); in my tables it occupies fourteenth place; while the other vowels stand still lower. The reason of this is not far to seek. It is simply a case of the operation of the law of physiological ease; as anyone may verify by pronouncing, in succession, the following syllables: *ap, pa, ab, ba, ak, ka, am, ma, ad, da*; and observing how much more easily those syllables are pronounced in which the consonant leads and the vowel follows.

Another interesting feature of this table is the high place occupied by the guttural *k* as initial sound. It stands above *p* and *m*, and next to *s* and *b*. This fact does not bear out the theory propounded by several writers on child-language, that those sounds are selected by the child for earliest acquirement whose pronunciation involves those portions of the vocal apparatus which are most easily seen, such as the lips (<sup>66</sup>), (<sup>76</sup>). According to this theory, not only the labial *p*, but the sounds *d, m, f, sh, th*, etc., ought to stand high in the list, because the movements involved in their pronunciation are plainly visible; while the guttural *k*, whose movements are absolutely out of sight, should stand very low. The contrary is the case; *k* stands third in the list of initial sounds, while *th*, whose movements are exceedingly obvious to sight, occupies the eighteenth place. This seems to prove that the child does *not* learn to utter sounds by watching the mouths of those who utter them in his presence; and this opinion is confirmed by the observation of Schultze, that the child does not usually look at the *mouth*, but at the *eyes* of the person speaking to him. On the other hand there seems no sufficient ground for the statement that the law of least effort is overturned by this frequency of the sound of *k*. This guttural sound is, for most children, no more difficult than the labials. Often it is one of the very earliest sounds employed. I know one child with whom it is more frequently used than even *b*. In short, so far as my observations go, I have no hesitation in saying that the child's earliest vocal utterances are not acquired

by imitation at all, either of sound or of movement, but that they are purely impulsive in their character. They are simply the result of the overflow of motor energy, which we have seen so prominent in other departments of the child's life; and they proceed at first along the lines of least resistance.

In the following tables I have given the results of a careful examination of seven hundred instances of mispronunciation which I have found in the above vocabularies. The first table shows the various sounds in the order of the number of times they are misused as well as the ways in which they are misused; the second and third tables enter into more detail.

In the following table the first column gives the sound misused; the second shows the number of times it is replaced by another sound; the third shows how often it is dropped, without being replaced; and the fourth shows how often it is brought into a word to which it does not belong (not as a substitute for some other sound, but as a pure interpolation, for no apparent reason).

| Sound Misused. | Replaced. | Dropped. | Interpolated. | Total. |
|----------------|-----------|----------|---------------|--------|
| R.             | 51        | 87       | 4             | 142    |
| L.             | 35        | 70       |               | 105    |
| S.             | 25        | 34       | 1             | 60     |
| G.             | 25        | 6        |               | 31     |
| T.             | 13        | 17       | 1             | 31     |
| Sh.            | 26        | 4        |               | 30     |
| K.             | 20        | 8        |               | 28     |
| Th (hard).     | 21        | 2        |               | 23     |
| F.             | 15        | 4        | 1             | 20     |
| D.             | 5         | 12       | 2             | 19     |
| Th (soft).     | 14        | 4        |               | 18     |
| Ng.            | 15        |          |               | 15     |
| N.             | 7         | 7        | 1             | 15     |
| W.             | 7         | 5        | 3             | 15     |
| Ch.            | 13        |          |               | 13     |
| Y.             | 1         | 10       | 1             | 12     |
| V.             | 8         | 2        |               | 10     |
| E.             | 2         | 5        |               | 7      |
| H.             | 2         | 5        |               | 7      |
| J.             | 5         |          |               | 5      |
| P.             | 4         | 1        |               | 5      |
| A.             |           | 4        |               | 4      |
| M.             | 4         |          |               | 4      |
| Wh.            | 3         |          |               | 3      |
| O.             | 3         |          |               | 3      |
| B.             | 3         |          |               | 3      |
| Z.             | 1         | 1        |               | 2      |
| Q.             | 1         |          |               | 1      |

The following table shows the relative frequency of *replacement* of the sounds when initial, medial and final, and also (in the case of the consonants) when occurring as one member of a double consonant (*e. g.*, as *r* in *cream*). It also gives the relative frequency of the substituted sounds:

| Sound Replaced. | When Initial. | When Medial. | When Final. | When Double. | Replaced by. | Times. | Examples.             |
|-----------------|---------------|--------------|-------------|--------------|--------------|--------|-----------------------|
| R.              | 21            | 21           | 9           | 4            | w            | 29     | kweem (cream).        |
|                 |               |              |             |              | l            | 6      | tommollä (tomorrow).  |
|                 |               |              |             |              | y            | 3      | all yite (all right). |
|                 |               |              |             |              | e            | 8      | tumble (tumbler).     |
|                 |               |              |             |              | v            | 1      | voom (room).          |
|                 |               |              |             |              | t            | 1      | tautech (traurig).    |
|                 |               |              |             |              | m            | 1      | pipe (ripe).          |
|                 |               |              |             |              | p            | 1      | Kaka (Carrie).        |
| L.              | 8             | 8            | 19          | 3            | k            | 1      |                       |
|                 |               |              |             |              | e            | 9      | minnie (milk).        |
|                 |               |              |             |              | w            | 7      | tabie (table).        |
|                 |               |              |             |              | u            | 7      | singu (shingle).      |
|                 |               |              |             |              | n            | 4      | setta (celery).       |
|                 |               |              |             |              | t            | 3      | bampe (lampe).        |
|                 |               |              |             |              | b            | 2      | degen (legen).        |
|                 |               |              |             |              | d            | 2      | apoo (apple).         |
| Sh.             | 17            | 2            | 7           |              | oo           | 1      |                       |
|                 |               |              |             |              | s            | 19     | fis (fish).           |
|                 |               |              |             |              | h            | 4      | höogar (sugar).       |
|                 |               |              |             |              | b            | 1      | tooz (shoes).         |
|                 |               |              |             |              | t            | 1      |                       |
| S.              | 18            | 4            | 3           | 6            | n            | 1      |                       |
|                 |               |              |             |              | t            | 8      | tweet (sweet).        |
|                 |               |              |             |              | h            | 8      | hlate (slate).        |
|                 |               |              |             |              | f            | 3      | poofee (pussy).       |
|                 |               |              |             |              | b            | 3      | dide (side).          |
| G.              | 19            | 5            | 1           | 4            | d            | 3      |                       |
|                 |               |              |             |              | k            | 17     | dass (glass).         |
|                 |               |              |             |              | t            | 2      | hookoo (sugar).       |
|                 |               |              |             |              | b            | 2      | toss (gross).         |
|                 |               |              |             |              | w            | 1      | bavy (gravy).         |
|                 |               |              |             |              | j            | 1      | dettin (getting).     |
|                 |               |              |             |              | n            | 1      |                       |
| Th (hard).      | 11            | 3            | 7           | 5            | f            | 10     | free. (three)         |
|                 |               |              |             |              | t            | 4      | mous (mouth).         |
|                 |               |              |             |              | s            | 3      | tank (thank).         |
|                 |               |              |             |              | p            | 1      | harf (hearth).        |
|                 |               |              |             |              | d            | 1      | nuppin (nothing).     |
|                 |               |              |             |              | n            | 1      |                       |
|                 |               |              |             |              | r            | 1      |                       |



| Sound Replaced. | When Initial. | When Medial. | When Final. | When Double. | Replaced by.          | Times.                | Examples.   |
|-----------------|---------------|--------------|-------------|--------------|-----------------------|-----------------------|---|
| K               | 11            | 7            | 2           | 7            | t<br>s<br>g<br>d      | 15<br>2<br>2<br>1     | bastet (basket).<br>sun (come).<br>untle (uncle).<br>tanny (candy).                         |
| F.              | 7             | 4            | 4           | 2            | p<br>s<br>k<br>t      | 6<br>5<br>2<br>2      | nup (enough).<br>buttersy (butterfly).<br>kork (fork).<br>õt (off).                         |
| Ng.             |               | 5            | 10          | 1            | n<br>e<br>a           | 12<br>2<br>1          | finner (finger).<br>tockies (stockings).<br>lockatair (rocking chair).                      |
| Th (soft).      | 11            | 3            |             |              | d<br>m                | 13<br>1               | altogedder (altogether).<br>dare (there).   |
| T.              |               | 6            | 7           |              | e<br>k<br>w<br>g<br>p | 6<br>4<br>1<br>1<br>1 | dockie (doctor).<br>bankie (blanket).<br>jackie (jacket).<br>coak (coat).<br>wawer (water). |
| Ch.             | 9             | 2            | 2           | 1            | s<br>t<br>sh          | 7<br>4<br>2           | sair (chair).<br>tillens (children).<br>shick (chick).                                      |
| V.              | 1             | 5            | 2           |              | b<br>f<br>d           | 5<br>2<br>1           | gib (give).<br>shufer (shovel).<br>Dadie (David).   |
| N.              |               | 1            | 6           |              | e<br>m<br>l           | 4<br>2<br>1           | buttie (button).<br>pim (pin).<br>lemolade (lemonade).                                      |
| W.              | 6             | 1            |             |              | v<br>l                | 6<br>1                | go vay (go away).<br>lalla (water).   |
| D.              | 1             | 4            |             |              | n<br>t<br>k           | 2<br>2<br>1           | towntownt (down town).<br>vinner (window).<br>kankie (candy).                               |
| J.              | 4             | 1            |             |              | d<br>g                | 4<br>1                | demidon (demijohn).<br>Gekkie (Jessie).   |
| P.              | 3             |              | 1           | 1            | b<br>t                | 2<br>2                | bee (please).<br>patie (paper).   |
| M.              | 2             | 2            |             |              | k<br>n<br>w           | 2<br>1<br>1           | hankie (hammer).<br>Waggie (Maggie).  |

| Sound Replaced. | When Initial. | When Medial. | When Final. | When Double. | Replaced by. | Times. | Examples.                         |
|-----------------|---------------|--------------|-------------|--------------|--------------|--------|-----------------------------------|
| Wh.             | 3             |              |             |              | f<br>h       | 2<br>1 | feel (wheel).<br>haiah (where).   |
| O.              |               |              | 3           |              | a<br>ē       | 2<br>1 | winna (window).                   |
| B.              | 1             | 2            |             |              | d<br>m       | 2<br>1 | badie (baby).<br>Milly (Billy).   |
| E.              |               |              | 2           |              | ă<br>oo      | 1<br>1 | vera (very).<br>cookoo (cookie).  |
| H.              | 1             | 1            |             |              | t<br>l       | 1<br>1 | torns (horns).<br>lă lo (la haut) |
| Y.              |               | 1            |             |              | ē            | 1      | bēwo (bureau).                    |
| Z.              |               | 1            |             |              | d            | 1      | Döderfeen (Josephine).            |
| Q.              |               | 1            |             |              | k            | 1      | skeeze (squeeze).                 |

The following table gives similar information with regard to the dropping of difficult sounds:

| Sound Dropped. | When Initial. | When Medial. | When Final. | When Double. | Examples.  |
|----------------|---------------|--------------|-------------|--------------|--|
| R.             | 2             | 61           | 24          | 50           | each (reach).<br>apicot (apricot).<br>dotta (daughter).<br>baselet (bracelet). |
| L.             | 10            | 37           | 23          | 39           | etta be (let me be).<br>peeze (please).<br>fa (fall).<br>buttafy (butterfly).  |
| S.             | 27            | 4            | 3           | 30           | poon (spoon).<br>Bottle (Boston).<br>gà (gas).<br>fàbewie (strawberry).        |
| T.             |               | 9            | 8           | 8            | dissance (distance).<br>bonny (bonnet).<br>sottin (stocking).                  |
| D.             | 1             | 5            | 6           | 12           | sanny (sandy).<br>gamma (grandma).<br>bines (blinds).                          |
| Y.             | 6             | 4            |             |              | ard (yard).<br>panna (piano).  |
| K.             | 4             | 2            | 2           | 2            | opf (kopf).<br>basset (basket).<br>boo (book).                                 |
| N.             | 1             |              | 6           | 1            | pi (pin).<br>burr (burn).  |
| G.             | 6             |              |             | 1            | atten (garten).  |
| W.             | 5             |              |             |              | ont (want).<br>oodn't (wouldn't).  |
| E.             | 3             |              | 2           |              | nuff (enough).<br>koff (coffee).   |
| H.             | 5             |              |             |              | eah (here).  |
| Sh.            | 4             |              |             |              | litta (schlitten).   |
| F.             |               | 3            | 1           | 2            | satie pin (safety pin).<br>natanoon (afternoon).                               |
| Th (soft).     | 3             | 1            |             |              | at (that).<br>ober air (over there).   |
| A.             | 4             |              |             |              | fade (afraid).<br>nudda (another).   |
| Th (hard).     |               |              | 2           |              | ba (bath).<br>mao (mouth).   |
| V.             | 1             |              | 1           |              | emmmum (warum).<br>Duttie (Gustave).   |
| P.             | 1             |              |             |              | tatie (potato).  |
| Z.             |               |              | 1           |              | no (nose).   |

A word of caution is perhaps necessary here. These tables do not show accurately the order of difficulty of the various sounds, inasmuch as they indicate the misuse of the sounds, not relatively to the number of *correct* pronunciations of each sound, but only relatively to the total number of mispronunciations. For example, in the first table *q* seems an easier sound than *b*, because it is only misused once, while *b* is misused three times. But if we remember that in the vocabularies *b* occurs fifty-five times as often as *q*, the case is entirely altered. Considered in this way, the order of difficulty, according to my observations, is approximately the following: *r, l, th, v, sh, y, g, ch, s, j, e, f, t, n, q, d, k, o, w, a, h, m, p, b*. The most difficult sound is *r* and the easiest *b*.

It will be observed also that, according to these tables, mispronunciation is very frequent in the case of double consonants, and most frequent of all in those combinations which belong to what Mr. Pitman calls the *pl* and *pr* series. Such words as *cream*, *bracelet* and *fly* are almost always mutilated; sometimes *r* and *l* are replaced by *w* or some other sound; sometimes they are omitted altogether.

Another thing to be observed is that the choice of a substitute for a difficult sound is often determined by the prominent consonant in the preceding or succeeding syllable. This leads to a reduplication of the easier sound in preference to the use of the more difficult one. The child says *cawkee* for *coffee*, *kork* for *fork*, or *lū lo* for *la haut*. The number of these reduplications is very large, and the device is adopted also in the case of difficult vowels; e. g., *Deddie* occurs for *Edie*, and *Dida* for *Ida*.

Another significant thing is the frequency with which the sound of *ē* is used as a substitute for difficult sounds, both vowel and consonantal, especially at the end of a word. The child says *ittie* for *little*, *finnie* for *finger*, and *ninnie* for *drink*.

In addition to the mispronunciations tabulated above, I find a large number of miscellaneous mispronunciations difficult to classify, such as the following: *medniss* for *medicine*, *Mangie fag* for *American flag*, *skoogie* for *excuse me*, *kidlie* for *tickle*, *pā-tā-soo* for *patent leather shoes*, etc., etc., etc.

If we seek now to discover some principle underlying the development of child-speech from the psychic point of view, we shall find, I believe, that principle of transformation, which we have already observed so frequently elsewhere, operating in this sphere also. The earliest utterances of the new-born have little or no psychic significance. As expressions of his thought, they have none at all. But by slow degrees these primitive utterances, modified, increased and combined, are associated with ideas, which are also modified, increased and combined, until finally the instrument of language is completely under control, and becomes the adequate medium for the expression of thought.

Not only may we make this statement in this general way, but it seems possible to trace, with approximate minuteness, the progress of a sound upward, from the earliest unexpressive condition to the highest, latest, most expressive state, and to indicate the principal stages on the way. These stages appear to be the same as those through which movements pass, viz., the *impulsive*, the *reflex*, the *instinctive*, and the *ideational*. The first sounds uttered by the child are simply the spontaneous will-less, idea-less manifestation of native motor energy. They do not require a sensory, but only a motor process, and that motor process is automatic. The same overflowing energy, the same muscle-instinct, which impels the child to grasp with the hands, to kick with the feet, etc., impels

him also to the exercise of his lips, tongue, larynx and lungs ( 50: 47 ). This is the *impulsive* stage. Then we find him uttering sounds in response to certain sensations. He sees a bright light, hears a peculiar sound, feels a soft, warm touch, and these sensations call forth certain sounds. These sounds are still only babblings, not involving the coöperation of will, but they do involve sensory as well as motor processes. The reflex arc, in its simplest form, is complete. Here imitation takes its rise. This is the *reflexive* stage. In the next place we can detect certain sounds which are expressive of the child's needs, and though still uttered probably without conscious intention, yet have a purpose and an end, viz., the satisfaction of those needs. The cry, which was at first monotonous and expressionless, now becomes differentiated to express various states of feeling, hunger, pain, weariness, etc. Here we have the *instinctive* stage. Finally the will takes full possession of the apparatus of speech, the child utters his words with conscious intention; imitation of sounds, from being passive and unconscious, becomes active and conscious; and words are joined together to give expression to ideas of constantly increasing complexity. Here we have reached the *ideational* or deliberative stage.

As an example of the transformation of a single sound through all these successive stages, let us take that sound which is, in the majority of cases, the first articulation, the syllable *ma*. At first this is pure spontaneity. The child lies contentedly in his cradle, motor energy overflows, the lips move, gently opening and closing, while the breath is expired, and this sound is produced, *mamamama*. As yet it has no meaning; it is a purely automatic utterance. But by and by the same sound is called forth by certain sensations, one of which is very probably the sight of the mother, or of some other person. The word as yet has no definite meaning, but is merely a sort of vague demonstrative ejaculation, a pure reflex. Later it becomes the expression of certain bodily needs and conditions, and now the hungry child utters this sound as the expression of the need of his natural nourishment. By this means, the word becomes firmly associated with the mother, first probably with the breast ( 70 ), but afterwards with her person in general, and so the final step in the transition is made, and the word *mama* now passes out of the semi-conscious, instinctive stage into the ideational. It becomes firmly associated with the mother, and with her only, it is used with a conscious purpose of communicating to her the child's wishes and ideas and, finally, in her absence, it is used in such a way as to show that her image is firmly stamped on his mind, and retained in his memory. In later life, more abstract and complex applications of this word are gradually mastered; but we have followed it far enough in its development for our present purpose. This word was chosen because it probably exemplifies better than any other the principle which we desired to illustrate, being associated with those feelings which arise earliest, last longest, and take the deepest hold upon the human soul; but almost any primitive utterance of infancy could be employed to exemplify, in a less complete manner, the principle enunciated.

A. A little Boston boy, whose mental development was observed and recorded by Miss Sara E. Wiltse.

B. Observations made by Professor J. M. Baldwin, of the University of Toronto, at whose suggestion the present work was undertaken.

C. A little Vermont boy, whose mother, a graduate of Smith College, made a very careful record of his mental development.

D. Vocabulary kindly sent me by Professor H. H. Donaldson, of the University of Chicago.

E. Observations made by a student of Wellesley College.

F. A little girl in Worcester, Mass., whom I observed for some time, and from whose parents I received some valuable notes.

G. Two little girls in Springfield, Mass., aged respectively twenty-four and twenty-two months. Observations made by their mother.

K. Observations kindly sent me by Professor E. A. Kirkpatrick, of Winona, Minnesota.

L. A girl in North Carolina, aged seventeen months. Notes taken by her mother.

M. Observations made by Professor and Mrs. J. F. McCurdy, of the University of Toronto.

R. A strong, healthy Canadian boy, whom I observed during a large part of his second year.

S. Notes on a little girl in Brooklyn, N. Y., sent me by her father.

T. A little boy in Boston. Vocabulary recorded by his mother.

W. A little girl in Worcester whose development was recorded by her mother.

Y. References to the lectures of the late Professor G. P. Young, on Philosophy and Psychology, delivered in the University of Toronto, but as yet unpublished.

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F. TRACY, Fellow in Clark University.